User manual

ADA-I9141
USB to RS-485 / RS-422 converter (without galvanic isolation)

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1. GENERAL INFORMATION

Thank you for your purchase of **CEL-MAR Company** product. This product has been completely tested and is covered by a two year warranty on parts and operation from date of sale.
If any questions or problems arise during installation or use of this product, please do not hesitate to contact Technical Support at +48 41 362-12-46 or e-mail support@cel-mar.pl.

1.1. WARRANTED INFORMATION

The **ADA-I9141** converter is covered by a two year warranty from date of sale. In case of being damaged it will be repair or the damaged component will be replace. The warranty does not cover damage caused from improper use, materials consumption or any unauthorized changes. If the product does not function (is damaged), or not operate in accordance with the instructions, will be repaired.
All warranty and no warranty repairs must be returned with paid transport and insuring to the **CEL-MAR Company.**
CEL-MAR Company under no circumstances won't be responsible for ensuing damage from improper using the product or as a result of random causes: the lightning discharge, the flood, the fire and the like.
CEL-MAR Company is not be held responsible for damages and loss including: loss of profits, loss of data, pecuniary losses ensuing from using or the impossibility of using this product.
In specific cases **CEL-MAR Company** discontinue all warranties and in particular do not follow the user manual and do not accept terms of warranty by the user.

1.2. GENERAL CONDITIONS FOR SAFE USE

The device should be installed in a safe and stable places (eg, electroinstallation cabinet), the powering cable should be arranged so as not to be exposed to trampling, attaching, or pulling out of the circuit.
Do not put device on the wet surface.
Do not connect devices for nondescript powering sources,
Do not damage or crush powering wires.
Do not make connection with wet hands.
Do not adapt, open or make holes in casings of the device!
Do not immerse device in water or no other liquid.
Do not put the fire opened on device sources: candles, an oil lamps and the like.
Complete disable from the supply network is only after disconnecting the power supply circuit voltage.
Do not carry out the assembly or disassembly of the device if it is enabled. This may result to short circuit and damage the device.

1.3. CE LABEL

CE

The CE symbol on the device CEL-MAR means compatibility with electromagnetic compatibility Electromagnetic Compatibility Directive **EMC 2004/108/WE.** Declaration of Conformity is available by contact with Technical Service (email: support@cel-mar.pl; phone: +48 41 362-12-46).

1.4. ENVIRONMENTAL PRESERVATION

This sign on the device inform about putting expended device with other waste materials. Device should send to the recycling. (In accordance with the act about the Electronic Appliance Expended from day 29 of July 2005)

1.5. SERVICE AND MAINTENANCE

The **ADA-I9141 converter** does not require the servicing and maintenance.
Technical support is available at number +48 41 362-12-46 in 8.00-16.00, from Monday to Friday or e-mail support@cel-mar.pl.

2. PRODUCT INFORMATION

Converter is delivered with: user manual, CD-ROM with software.

2.1. PROPERTIES

- Conversion of USB to RS485/422 standard,
- Compatibility with USB1.1 and USB 2.0 standard,
- Virtual Serial Port,
- Transmitted signals: RX, TX,
- Operate on the Bus: RS485 two-wire and four-wire in point-to-point mode or multi-point, RS422 in point-to-point mode,
- STANDARD Baud rate (bps): 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400, 460800, 921600,
- PROFIBUS baud rate (bps): 300 bps, 600 bps, 1200 bps, 2400 bps, 4800 bps, 9600 bps,19200 bps, **93750**(230400) bps, **187500**(460800) bps, **500000**(921600) bps, **1500000**(14400) bps.
- Transparent for all protocols: MODBUS, DNP, PROFIBUS and other,
- Any format of byte defined with the specification of RS232 interface,
- Power supply from the USB port,
- Interface casing,
- RS-485/RS-422 interface connection via screw terminal block – max.Ø 1mm² ,
- USB interface connection via Mail USB connector A-type or USB cable with A-type connector,
- Casing dimensions (W x D x H) 55 mm x 30 mm x 24,5 mm.

2.2. DESCRIPTION

ADA-I9141 converts USB to RS-485/RS-422 standard without interference of data format and it is automatically detect by PC system after connecting to USB network (Plug&Play device). ADA-I9141 uses data transmission lines Rx, Tx & GND (signal ground) for communication with other RS485/422 devices.
This converter doesn't required external power supply (it is powered from USB bus) and it uses asynchronous baud rate up to 921,3 kbps (drivers for STANDARD baud rate) / 1500000 bps (drivers for PROFIBUS baud rate).
A-type USB Mail plug (or USB cable with A-type connector) enables simple connection to computer and on other side simple connection the RS485/422 Bus provide plug-in screw terminal block.
Together with the ADA-I9141 we provide the drivers, which after installation, create in operating system additional COM port on the next free number e.g. COM3. It can be use as standard COM port but it isn't hardware port but virtual, create in Windows system. This is the reason why some applications running in DOS and use this port, can operate improperly.

3. CONFIGURATION

ADA-I9141 converter can be configured for operating in RS485 or RS422 by the use MODE switch (fig.1). Description of setting is shown in the table below.

Switch MODE	Description
RS485	Operating in RS485 standard on 2 and 4-wire bus in point-to-point or multi-point topology. RS485 transmitter enable only during data transmission
RS422	Operating in RS422 standard on 4-wire bus in point-to-point. RS422 transmitter continuously enable.

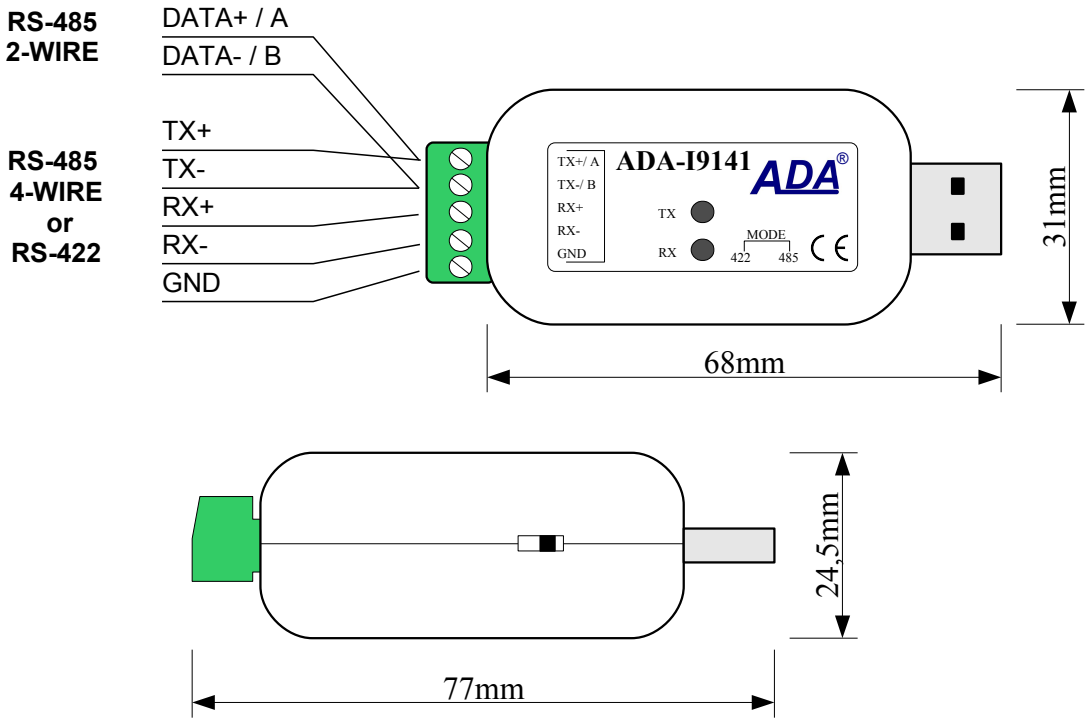


Fig 1. ADA-I9141 view

4. INSTALLATION

This chapter will show you correctly connection of the ADA-I9141 to RS-485/RS-422 Bus. To compensate the ground potential of devices operating on RS485/RS422 Bus you should connect the grounds of RS485/RS422 interfaces to the converter terminals GND. This connection should be done individually for each systems if standard wiring of RS485/RS422 bus not provide correct transmission.

In the purpose of disruptions minimization of influence from environment you should :
- use shielded twisted-pair cable in the system, of which it is possible to connect the shield to ground on one end of cable,
- lay the signals cable in the distance no short than with 25 cm from power cable.

4.1. CONNECTION TO RS485/RS422 BUS

RS485/RS422 interface of ADA-I9141 converter is available on screw terminal block described as: Tx+/A, Tx-/B, Rx+, Rx-, GND.
ADA-I9141 can operate on RS422 bus or RS485 bus - both bus need suitable wiring.

4.1.1. CONNECTION TO RS422 OR RS485 (4W) BUS 4-WIRE

Examples connection of ADA-I9141 to RS422 4-wire bus or RS485(4W) in point-to-point and multi-point topology are shown below.

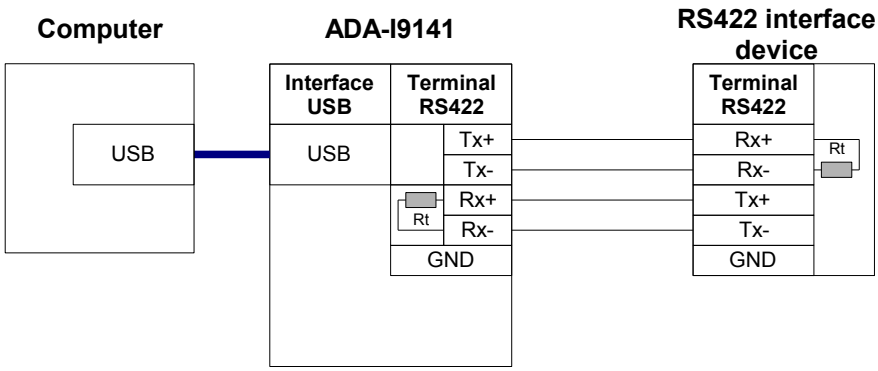


Fig 2. Example connection of RS422 or RS485(4W) interface devices in Point-to-Point topology to ADA-I9141 converter; Tx, Rx signals

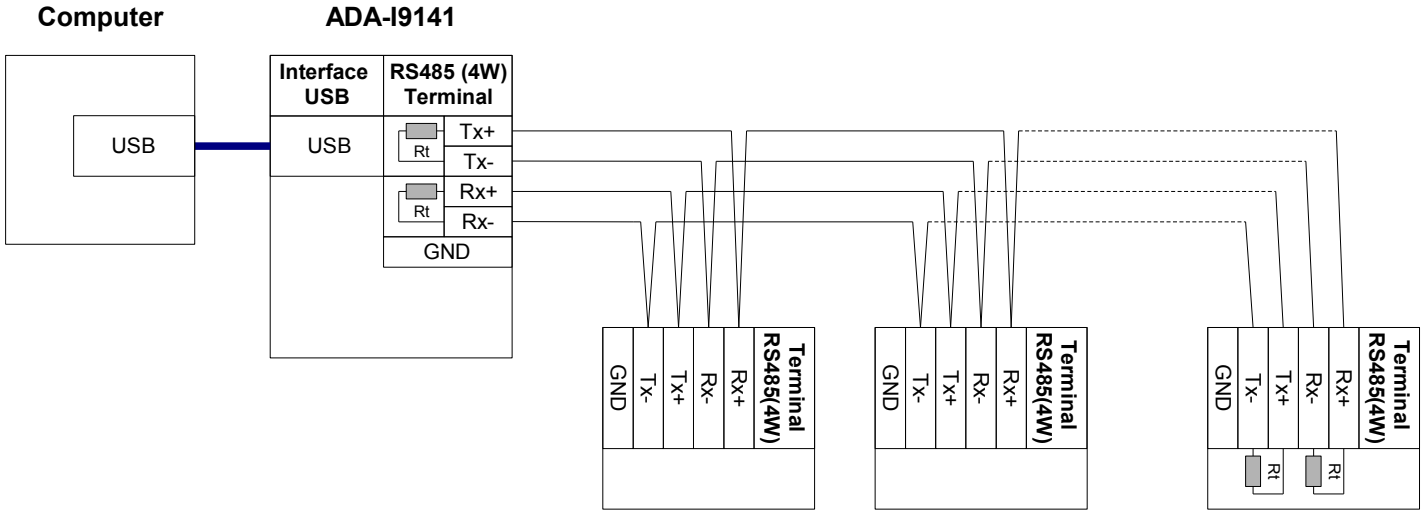


Fig 3. Example of connection RS485(4W) interface devices to ADA-I9141 converter

4.1.2. CONNECTION TO RS485 2-WIRE BUS

Most of RS485 interface devices use two-wire bus for data transmission. You should check the setting of ADA-I9141 to operate on RS485 2-wire bus before connecting to 2-wire network – MODE switch should be set on RS485, then connect the bus wires to terminal TX+, TX- as shown below.

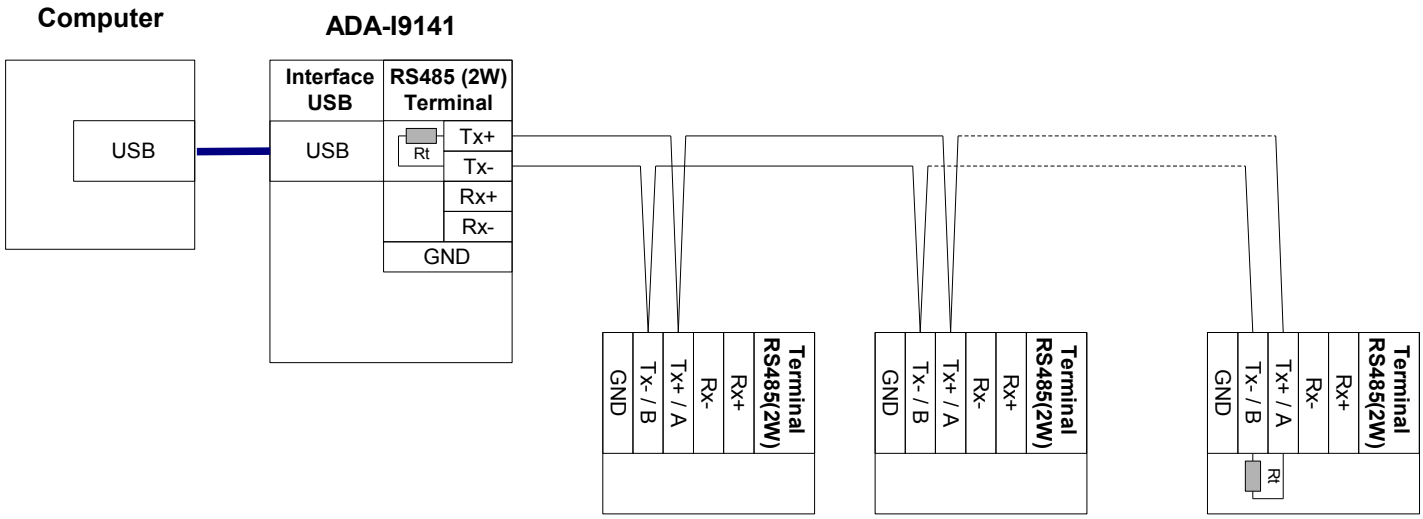


Fig 4. Connection example of RS485(2W) interface devices to ADA-I9141 converter

4.2. LINE TERMINATION

The application of Line Termination (terminator) Rt = 120 ohms will reduce electrical reflection in data line at high baud rate. It is not needed below 9600Bd. You should use the Line Termination resistor if the distance is over 1000m @ 9600Bd or 700m @ 19200Bd transmission. The Line Termination (terminators) connect to RS485/422 screw terminal block of ADA-I9141 by the use of screwdriver.
Example connection of Rt are shown on Fig. 2, 3, 4 . Resistor Rt = 120 Ω .

4.3. CONNECTION TO USB INTERFACE OF PC

Converter is equipped with USB A-type connector for easily connection to computer by the use USB cable Aplug-Asocked.

4.4. POWER SUPPLY

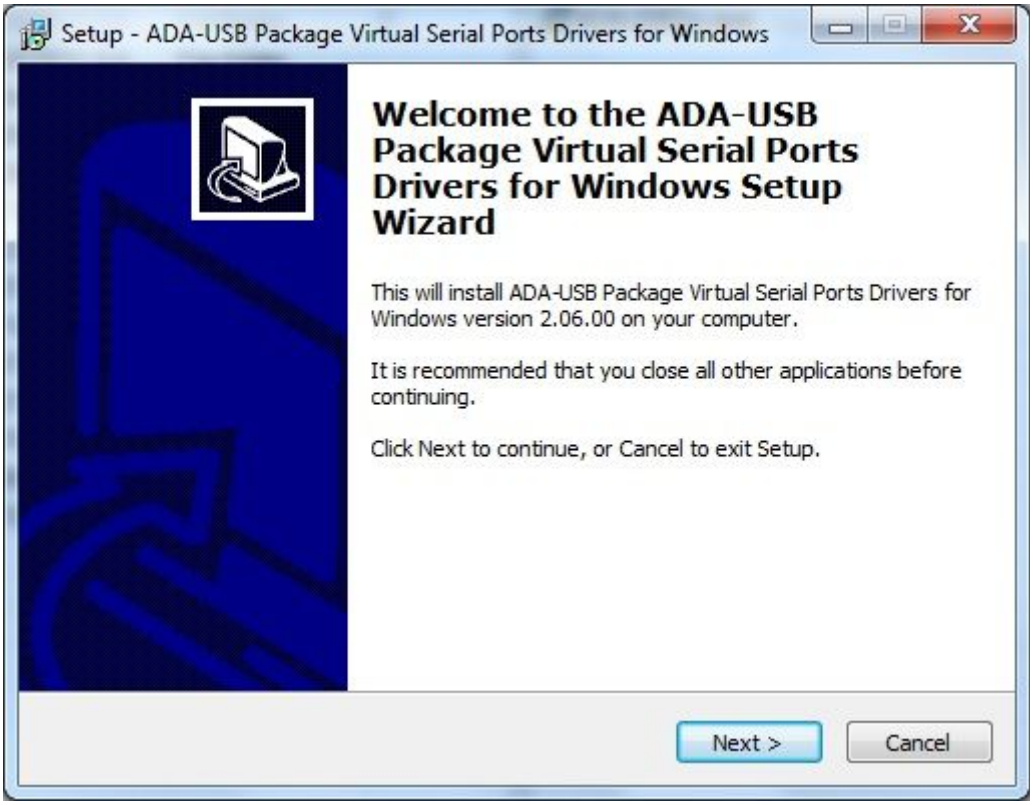
ADA-I9141 converter is fed from USB port of PC.

5. DRIVERS INSTALLATION IN SYSTEM WINDOWS

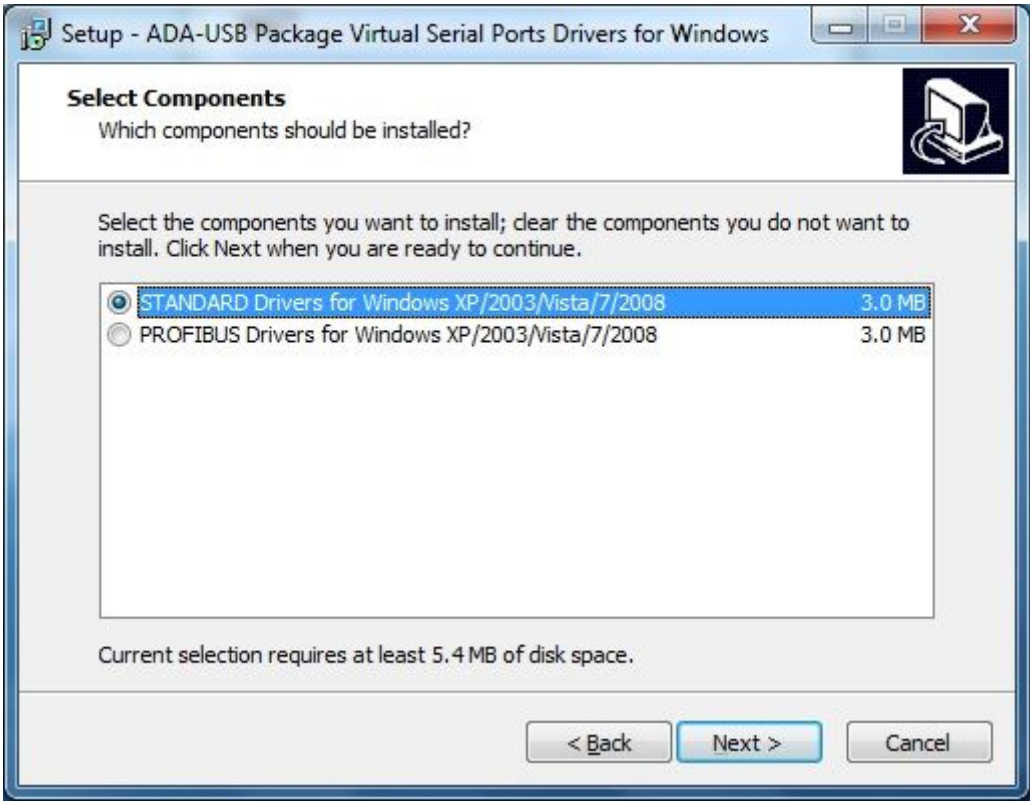
Converter ADA-I9141 is purchased with the driver package Installer for Windows systems on CD-ROM.
For installation follow the steps below:
a/ insert the CD-ROM to optical driver of the computer,
b/ the installation wizard will run automatically, if not double click ***ADAUSBDRV.exe***.
c/ following the steps of installation wizard, will be installed the Drivers and Uninstaller for the Windows systems 98, ME, 2000, XP, 2003, Vista, Win7, 2008,
d/ connect the convert to USB port of computer and follow the steps of installation wizard.

5.1. EXAMPLE DRIVER INSTALLATION IN WINDOWS 7 SYSTEM

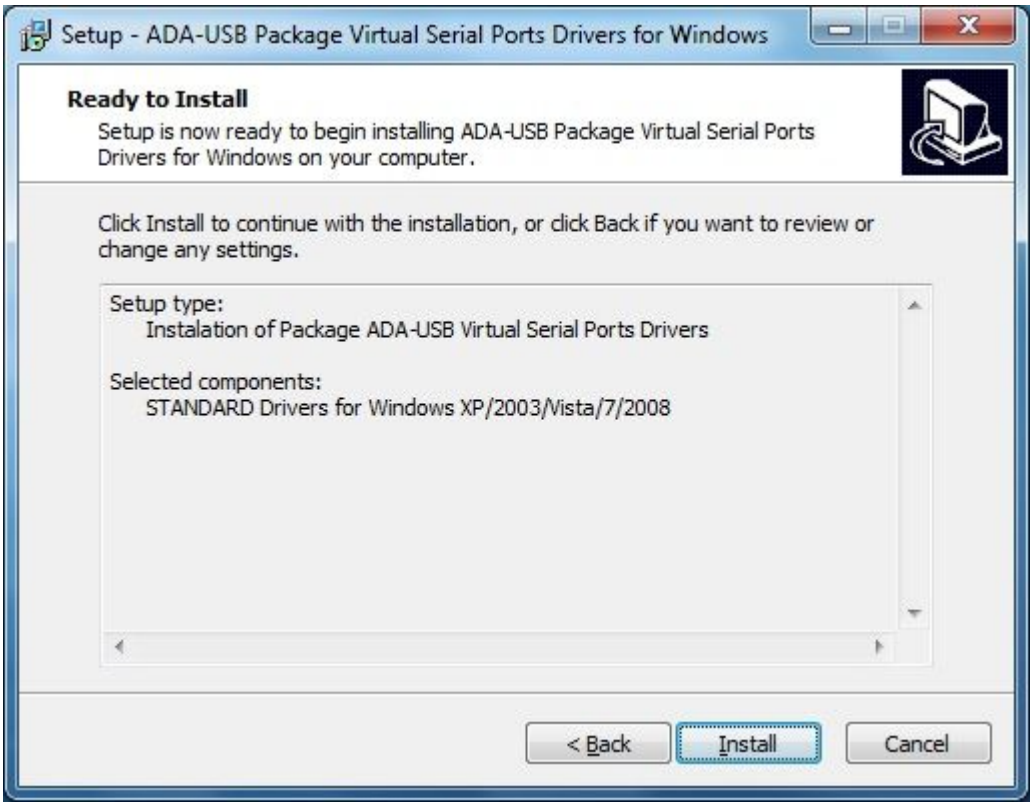
Together With ADA-I9141 converter is delivered CD-ROM with drivers for the baud rates:
a/ Standard
b/ Profibus
Driver installation have to be done from the account with Administrator permissions. For the drivers installation follow the steps bellow:
a/ insert the CD-ROM to optical driver of computer,
b/ the installation wizard will run automatically, if not double click ***ADAUSBDRV.exe*** form the CD-ROM.
After running the installer, the wizard installation window will appear.


Setup - ADA-USB Package Virtual Serial Ports Drivers for Windows
Welcome to the ADA-USB Package Virtual Serial Ports Drivers for Windows Setup Wizard
This will install ADA-USB Package Virtual Serial Ports Drivers for Windows version 2.06.00 on your computer.
It is recommended that you close all other applications before continuing.
Click Next to continue, or Cancel to exit Setup.
Next >
Cancel

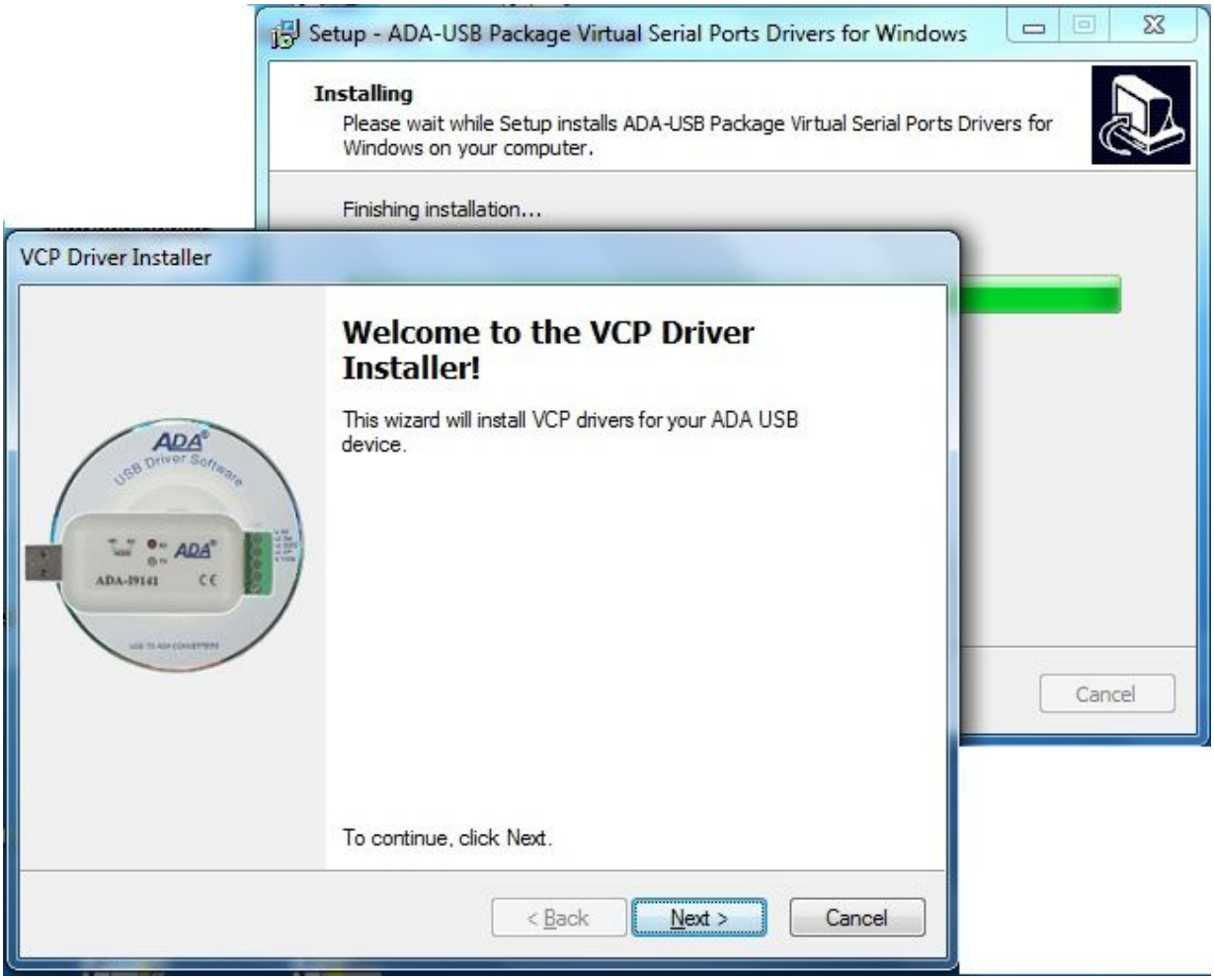
Press [Next]


Setup - ADA-USB Package Virtual Serial Ports Drivers for Windows
Select Components
Which components should be installed?
Select the components you want to install; clear the components you do not want to install. Click Next when you are ready to continue.
STANDARD Drivers for Windows XP/2003/Vista/7/2008 3.0 MB
PROFIBUS Drivers for Windows XP/2003/Vista/7/2008 3.0 MB
Current selection requires at least 5.4 MB of disk space.
< Back
Next >
Cancel

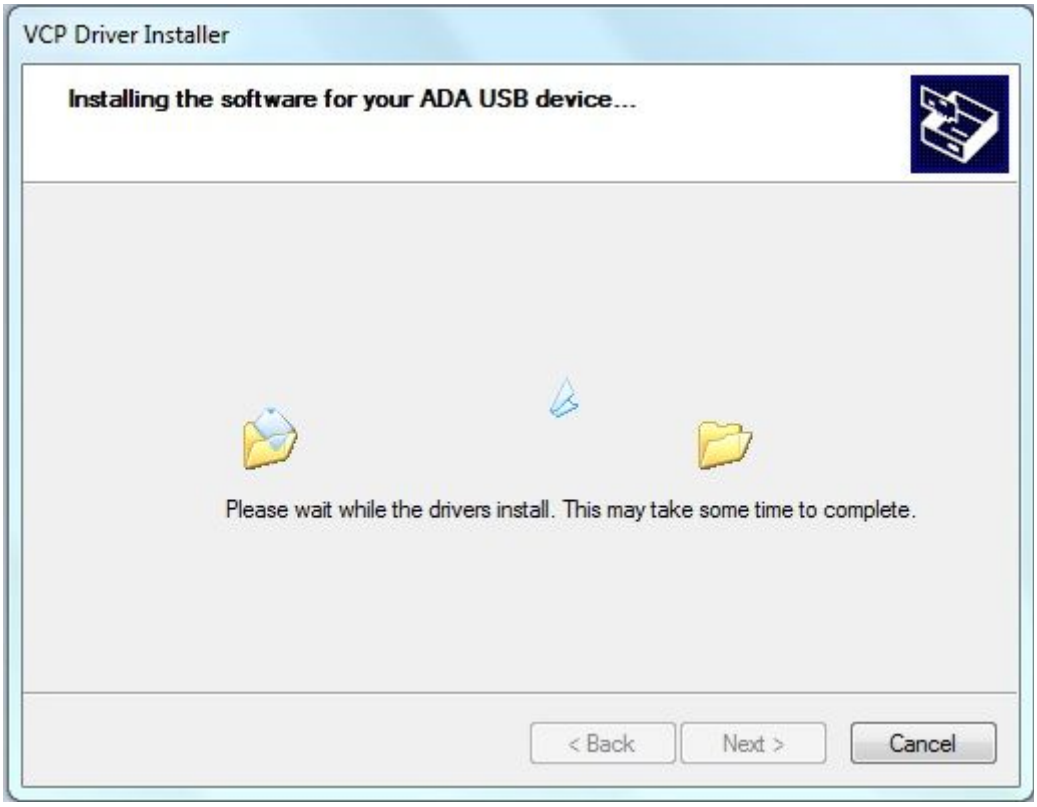
Select STANDARD Drivers and press [Next]

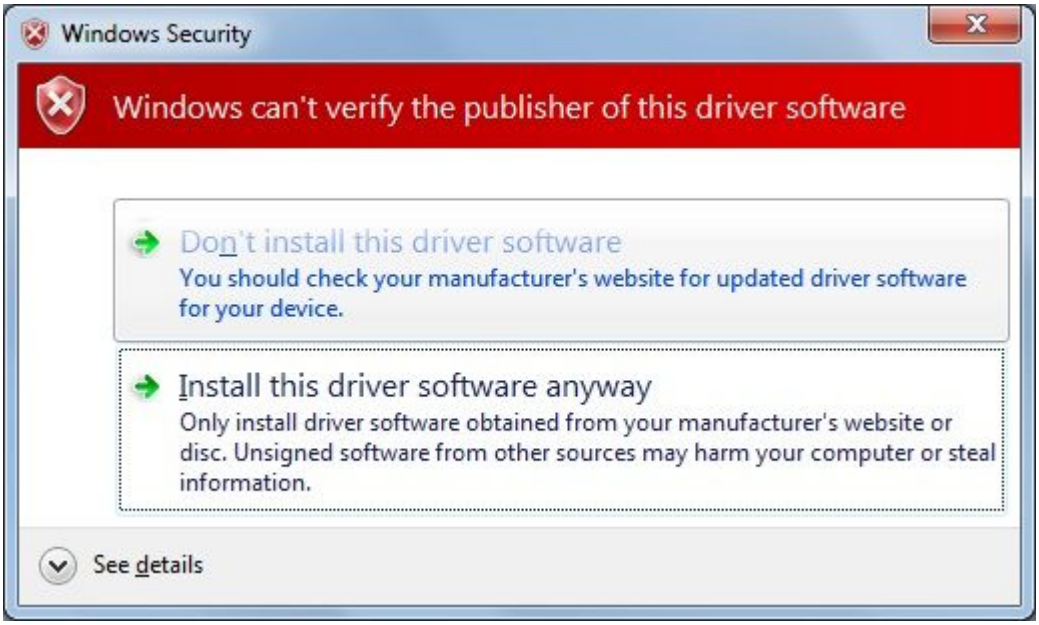

Setup - ADA-USB Package Virtual Serial Ports Drivers for Windows
Ready to Install
Setup is now ready to begin installing ADA-USB Package Virtual Serial Ports Drivers for Windows on your computer.
Click Install to continue with the installation, or click Back if you want to review or change any settings.
Setup type:
Instalation of Package ADA-USB Virtual Serial Ports Drivers
Selected components:
STANDARD Drivers for Windows XP/2003/Vista/7/2008
< Back
Install
Cancel

Press [Install]

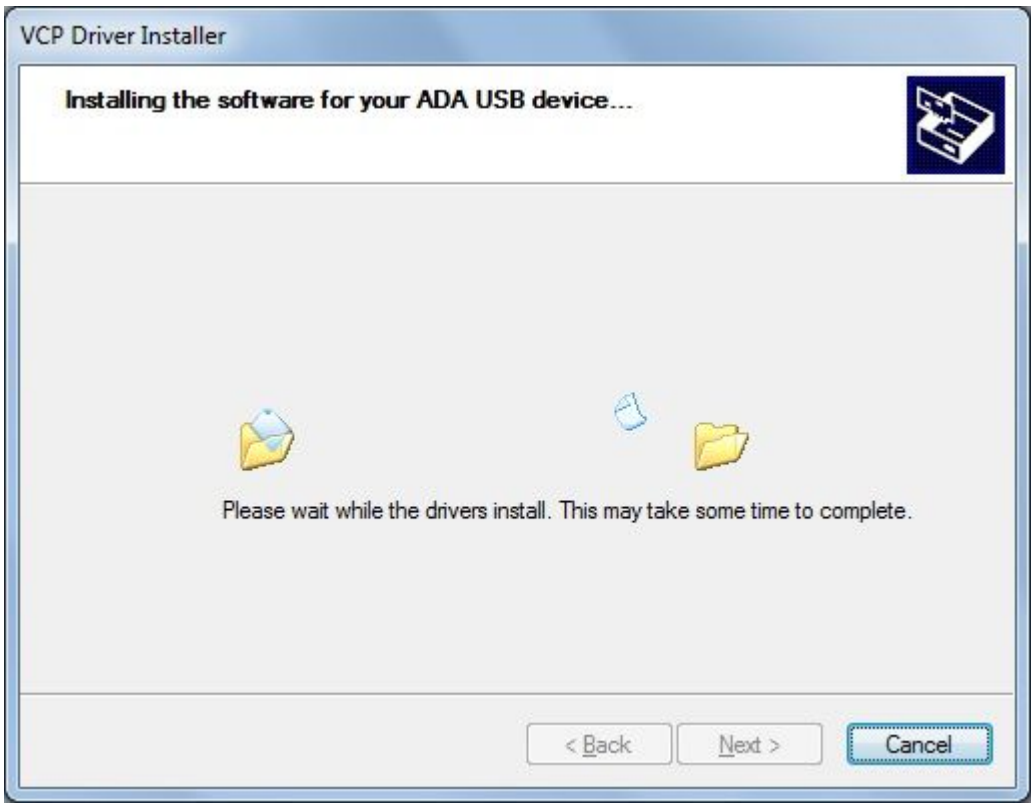

Setup - ADA-USB Package Virtual Serial Ports Drivers for Windows
Installing
Please wait while Setup installs ADA-USB Package Virtual Serial Ports Drivers for Windows on your computer.
Finishing installation...
Cancel
VCP Driver Installer
Welcome to the VCP Driver Installer!
This wizard will install VCP drivers for your ADA USB device.
To continue, click Next.
< Back
Next >
Cancel

Press [Next], will be installed Drivers for USB Bus.


VCP Driver Installer
Installing the software for your ADA USB device...
Please wait while the drivers install. This may take some time to complete.
< Back
Next >
Cancel


Windows Security
Windows can't verify the publisher of this driver software
Don't install this driver software
You should check your manufacturer's website for updated driver software for your device.
Install this driver software anyway
Only install driver software obtained from your manufacturer's website or disc. Unsigned software from other sources may harm your computer or steal information.
See details

Press [Install this driver software anyway]. Installation of drivers for USB Bus will start.


VCP Driver Installer
Installing the software for your ADA USB device...
Please wait while the drivers install. This may take some time to complete.
< Back
Next >
Cancel

Windows Security
Windows can't verify the publisher of this driver software
Don't install this driver software
You should check your manufacturer's website for updated driver software for your device.
Install this driver software anyway
Only install driver software obtained from your manufacturer's website or disc. Unsigned software from other sources may harm your computer or steal information.
See details

Press [Install this driver software anyway]. Installation of drivers for Virtual Port will start.

VCP Driver Installer
Congratulations! You are finished installing your ADA device.
The drivers were successfully installed on this computer.
You can now connect your device to this computer. If your device came with instructions, please read them first.
Driver Name
Status
CEL-MAR ADA - USB Serial Converter (1...
Ready to use
CEL-MAR ADA - Virtual USB Serial Port (...
Ready to use
< Back
Finish
Cancel

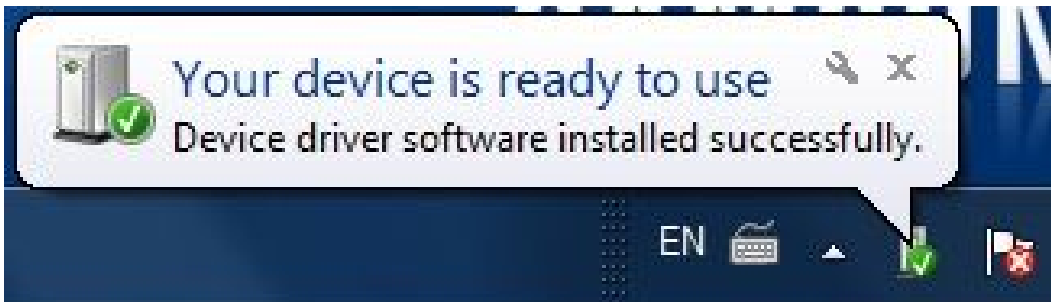
Press [Finish]

Setup - ADA-USB Package Virtual Serial Ports Drivers for Windows
Completing the ADA-USB Package Virtual Serial Ports Drivers for Windows Setup Wizard
Setup has finished installing ADA-USB Package Virtual Serial Ports Drivers for Windows on your computer.
Click Finish to exit Setup.
Finish

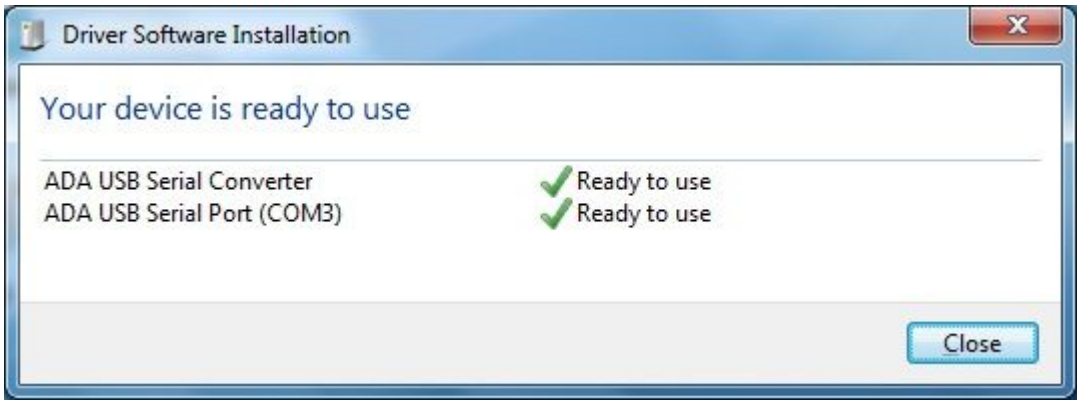
Press [Finish].
The driver for ADA-I9141 have been installed. This can be checked in “Uninstall or change a program“.

Control Panel ▸ Programs ▸ Programs and Features
Search Programs and Features
Control Panel Home
View installed updates
Turn Windows features on or off
Uninstall or change a program
To uninstall a program, select it from the list and then click Uninstall, Change, or Repair.
Organize
Uninstall/Change
Name
Publisher
Windows Driver Package - CEL-MAR ADA - USB Serial Converter (10/22/2009 2.06.00)
CEL-MAR
Windows Driver Package - CEL-MAR ADA - Virtual USB Serial Port (10/22/2009 2.06.00)
CEL-MAR
CEL-MAR Product version: 10/22/2009 2.06.00

Now you can connect ADA-I9141 to computer port.



After connection will appear the Tool tip with [Your device is ready to use]. To see the details press the Tooltip, and will appear information window where you can see which COM port was assigned to converter.



After this installation, RS485/422 port of ADA-I9141 converter is available in the system as normal COM port. You have to remember about specified baud rate for communication.

If during installation you selected driver for Standard baud rates you would be able to use:
300 bps, 600 bps, 1200 bps, 2400 bps, 4800 bps, 9600 bps, 19200 bps, 38400 bps, 57600 bps, 115200 bps, 230400 bps, 460800 bps, 921600 bps.

If during installation you selected driver for Profibus baud rates you would be able to use:
300 bps, 600 bps, 1200 bps, 2400 bps, 4800 bps, **9600** bps,**19200** bps, **93750** bps (if you select 230400 bps), **187500** bps (if you select 460800bps), **500000** bps (if you select 921600 bps), **1500000** bps (if you select 14400 bps).

6. DRIVER UNINSTALLATION

6.1. DRIVER UNINSTALLATION IN WINDOWS 98/ME SYSTEMS

In this system driver uninstallation have to be done according follow steps:

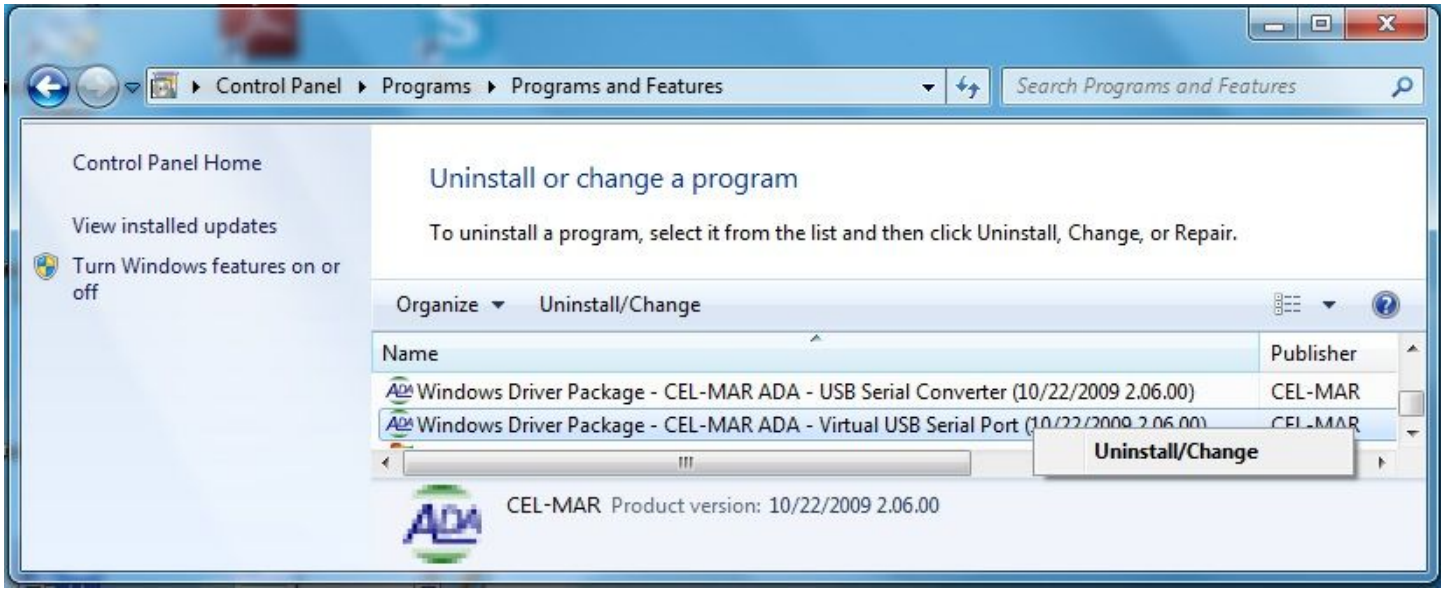
a/ disconnect converter from computer,
b/ select menu ***Start > Setting > Control Panel > Add > Remove Programs,***
c/ select from the list ***"ADA USB Serial Converter Driver"*** and press **[Change / Remove]**,
e/ reboot the computer.

6.2. DRIVER UNINSTALLATION IN WINDOWS 2000/XP/2003/VISTA/7/2008 SYSTEMS

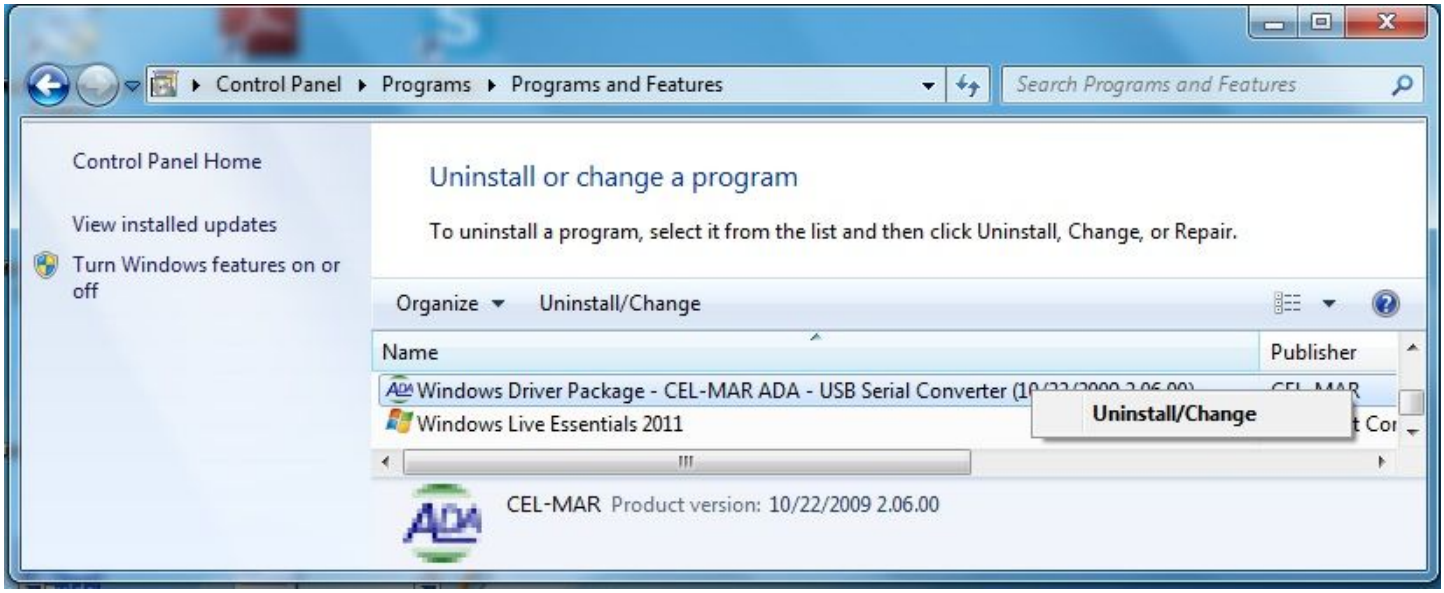
In this system driver uninstallation have to be done according follow steps:
a/ disconnect converter from computer,
b/ login as the ***Administrator,***
c/ select menu ***Start > Setting > Control Panel > Add > Remove Programs,***
d/ select from the list ***Windows Driver Package – CEL-MAR ADA – Virtual USB Serial Port,***
e/ press [Change / Remove], Virtual USB Serial Port driver will be uninstalled,
f/ select from the list ***Windows Driver Package – CEL-MAR ADA – USB Serial Converter,***
g/ press [Change / Remove], driver converter of USB Bus will be uninstalled,
h/ after uninstallation reboot the computer.

6.2.1. EXAMPLE DRIVER UNINSTALLATION IN WINDOWS 7 SYSTEMS

Windows 7 system driver uninstallation have to be done according follow steps:
a/ disconnect converter from computer,
b/ login the ***Administrator account ,***
c/ select menu ***Start > Control Panel > Programs > Uninstall,***
d/ select from ***Windows Driver Package – CEL-MAR ADA – Virtual USB Serial Port,***
e/ press ***[Uninstall/Change]***, Virtual USB Serial Port driver will be uninstalled


Control Panel ▸ Programs ▸ Programs and Features
Search Programs and Features
Control Panel Home
View installed updates
Turn Windows features on or off
Uninstall or change a program
To uninstall a program, select it from the list and then click Uninstall, Change, or Repair.
Organize
Uninstall/Change
Name
Publisher
Windows Driver Package - CEL-MAR ADA - USB Serial Converter (10/22/2009 2.06.00)
CEL-MAR
Windows Driver Package - CEL-MAR ADA - Virtual USB Serial Port
Uninstall/Change
CEL-MAR Product version: 10/22/2009 2.06.00

f/ select from the list ***Windows Driver Package – CEL-MAR ADA – USB Serial Converter***


Control Panel ▸ Programs ▸ Programs and Features
Search Programs and Features
Control Panel Home
View installed updates
Turn Windows features on or off
Uninstall or change a program
To uninstall a program, select it from the list and then click Uninstall, Change, or Repair.
Organize
Uninstall/Change
Name
Publisher
Windows Driver Package - CEL-MAR ADA - USB Serial Converter
Windows Live Essentials 2011
Uninstall/Change
CEL-MAR Product version: 10/22/2009 2.06.00

g/ press ***[Uninstall/Change],*** driver converter of USB Bus will be uninstalled,

h/ after uninstallation reboot the computer.

6.3. EMERGENCY DRIVER UNINSTALLATION

If there are problems with correct operation of drivers or converter and or on computer was installed driver other devices this type, you can use special software form delivered CD-ROM to clean the system form files and entries in the system registry. This can be done after uninstallation descried in point 6.1 and 6.2.

6.3.1. EMERGENCY DRIVER UNINSTALLATION IN WINDOWS 98/ME/2000

Emergency driver uninstallation in Windows 98/ME/2000 system have to be done according follow steps:

a/ disconnect converter from computer,

b/ from CD-ROM delivered with converter, copy to hard disk the folder ***Windows\Win-98ME_1.09.06\FTClean*** for Windows 98/ME or ***Windows\Win-2000\FTClean*** for Windows 2000,

c/ from FTClean folder run the application ***FTClean.exe*** and follow the Tooltip,

d/ after finishing, reboot the computer.

6.3.2. EMERGENCY DRIVER UNINSTALLATION IN WINDOWS XP/2003/Vista/7/2008

Emergency driver uninstallation in Windows XP/2003/Vista/7/2008 system have to be done according follow steps:

a/ disconnect converter from computer,

b/ login the ***Administrator account,***

c/ from CD-ROM delivered with converter, copy to hard disk the folder ***Windows\Win-XP-2003-Vista-7-2008_2.06\ CDMUninstaller***,

d/ from CDMUninstaller folder run the application ***uninstall.bat***,

e/ after finishing, reboot the computer.

7. USING

After property connection according to section above you can start using the converter. During data transmission LEDs should blink and they indicate appropriately:

LED	*Description*
Rx (yellow)	data reception via ADA-I9141 converter from RS485/RS422 port.
Tx (red)	data transmission from ADA-I9141 converter via RS485/RS422 port.

7.1. BAUD RATE SELECTION FOR PROFIBUS COM PORT

For setting correct Profibus baud rate (after installation "Virtual Port" driver for Profibus) in application using virtual port COM follow table below.

Set baud rate [bps]	Actual baud rate [bps] Profibus
230400	**937500**
460800	**187500**
921600	**500000**
14400	**1500000**

7.2. SELECTION OF COM PORT LARGER THAN COM9

If virtual port COM of converter will install in Windows OS as COM10 or larger then in application using this port you should type COM port address as: \\.\COM10.

8. SPECIFICATION

Parameters		
	USB	**RS-485/422**
Connector	A-type Mail	Screw terminal block, max. wire Ø 1mm^2
Line length	up to 5m	1200 m (depend on baud rate)
Max. number of connected devices	1	32
Transmission line	USB cable with socked A-type	Twisted cable 1-pair, 2- pair or 4-pair, UTP Cat.5e, shield inside large interferences STP Cat. 5e.
Maximum baud rate	do 921,6 kbps (Standard) / do 1500 kbps (Profibus)	
Transmission type	Asynchronous, half duplex or full duplex,	
Standards	EIA-485, CCITT V.11, USB1.1, USB2.0	
Optical Signalization	• RX red LED data reception on RS485/422 port, • TX yellow LED data transmission on RS485/422 port,	
Nominal work conditions		
Power requirements	from USB of Computer	
Power	< 0,5W	
Galvanic isolation	non	
Operating temperature	0 ÷ +23 ÷ +50°C	
Humidity	5 ÷ 95% - non-condensing	
Electromagnetic compatibility	Resistance to disruptions according to the standard PN-EN 55024. Emission of disruptions according to the standard PN-EN 55022.	
Safety requiring	According to the PN-EN60950 norm.	
Environment	Commercial and light industrial.	
Casing		
Dimensions (W x D x H)	55mm x 30mm x 24,5mm	
Material	ABS	
Degree of casing protection	IP30	
Weight	< 0,10 kg	
Conditions of storing and transportation		
Storage temperature	-20 ÷ 70°C	
Humidity	5 ÷ 95% - non-condensing	

Dear Customer,

Thank you for purchasing **CEL-MAR Company** product.
We hope that the **ADA-I9141 converter** and this user manual help simplify your network of 1-Wire sensor for industrial applications. We also wish to remind you that CEL-MAR Company are a manufacturer of the widest selections of data communications products in the world in applications such as: data transmission converters in RS232, RS485, RS422, USB, Current Loop, Fibre-Optic and Ethernet Converters and many others.
We welcome your feedback so please contact us to tell how you like our products and how we can satisfy you present and future needs.

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